DETAILED ACTION

Allowable Subject Matter

1. Claims 1-25 are allowed.

2. The following is an examiner's statement of reasons for allowance:

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is in a range from about 50 to less than 250 micrometers squared and the heater thickness is in a range from about 500 to about 6000 angstroms, recited in claim 1. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer and the conductor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is in a range from about 50 to less than 250 micrometers squared and the heater thickness is in a range from about 500 to about 5000 angstroms, recited in claim 6. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer and the conductor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is in a range from about 50 to about 350 micrometers squared and the heater thickness is less than 1100 angstroms, recited in claim 9. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer comprised of a passivation layer and a cavitation layer, having an overcoat thickness on the resistor layer and the conductor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length, the heater width and the heater thickness define a heater, the heater length multiplied by the heater width is in a range from about 50 to about 350 micrometers squared and the heater thickness is in a range from about 500 to about 6000 angstroms and the heater is adapted to emit an ink drop with an energy pulse in a range from about 0.007 to about 0.83 microjoules, recited in claim 11. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer comprised of a passivation layer and a cavitation layer, having an

overcoat thickness and the resistor thickness defining a heater thickness, wherein the heater length, the heater width and the heater thickness define a heater, the heater being arranged adjacent the ink via wherein the heater length multiplied by the heater width is in a range from about 50 to about 350 micrometers squared and the heater thickness is in a range from about 500 to about 5000 angstroms and the heater is adapted to emit an ink drop with an energy pulse in a range from about 0.007 to about 0.69 microjoules, recited in claim 16. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is less than 400 micrometers squared and the heater thickness is less than 4000 angstroms and wherein an energy to emit an ink drop from the heater chip during use is less than about 0.64 microjoules, recited in claim 17. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is in a range from about 50 to about 500

micrometers squared and the heater thickness is in a range from about 500 to about 1000 angstroms, recited in claim 21. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is less than 400 micrometers squared and the heater thickness is less than 1100 angstroms, recited in claim 23. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is less than 400 micrometers squared and the heater thickness is in a range from about 500 to about 6000 angstroms, recited in claim 24. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

The prior art does not disclose, suggest or render obvious the combination of an overcoat layer having an overcoat thickness on the resistor layer, the overcoat

thickness and the resistor thickness defining a heater thickness wherein the heater length multiplied by the heater width is in a range from about 50 to about 500 micrometers squared and the heater thickness is in a range from about 500 to less than about 1000 angstroms, recited in claim 25. This invention solves the problem of providing optimum heater configurations requiring little firing energy that supports relatively long life, small size, high density, chip stability and good heat dissipation properties.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art of Ikeda et al. (US 4,567,493) discloses a liquid jet recording head having an overcoat layer having an overcoat thickness on the resistor layer, but does not disclose the ranges as recited.

Response to Arguments

4. Applicant's arguments, filed 7/9/2004, with respect to claims 1-25 have been fully considered and are persuasive. The final rejection of claims 1-25, filed 9/15/2004 has been withdrawn.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juanita D. Stephens whose telephone number is (571) 272-2153. The examiner can normally be reached on Flex (Monday-Thursday 9:00 am -6:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juanita D. Stephens
Primary Examiner
Art Unit 2853

/Juanita D. Stephens/
Primary Examiner, Art Unit 2853
April 11, 2008